



# Homeland Security

## **Detection Systems for Biological and Chemical Countermeasures (DSBCC)**

**Research Announcement 03-01**

**(RA 03-01)**

**Department of Homeland Security**

**Homeland Security Advanced Research Projects Agency  
(HSARPA)**

**September 23, 2003**

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# 1. BACKGROUND

The Homeland Security Advanced Research Projects Agency (HSARPA) invests in programs offering the potential for revolutionary changes in technologies that promote homeland security and accelerates the prototyping and deployment of technologies that reduce homeland vulnerabilities. HSARPA is the external funding arm for the Department of Homeland Security Science and Technology Directorate. HSARPA performs these functions in part by awarding procurement contracts, grants, cooperative agreements, or other transactions for research and prototypes to public or private entities, businesses, federally funded research and development centers and universities.

The goal of the HSARPA Detection Systems for Biological and Chemical Countermeasures (DSBCC) Program is to develop, field-test, and transition to commercialization the next-generation of biological and chemical detectors required to effectively counter potential biological and chemical attacks on the homeland. The Department of Homeland Security Science and Technology Directorate has identified the following high priority requirements as Technical Topic Areas (TTAs) to be addressed in this solicitation (These TTAs are described in greater detail in Section 3, “System Performance Goals”, below):

## 1.1 Systems for Biological Countermeasures

### ***TTA-1: Bioagent Autonomous Networked Detectors (BAND)***

This “detect-to-treat” system will be capable of continuous (around the clock), distributed monitoring of outdoor urban areas. The system will contain fully autonomous, networked, broad spectrum (bacteria, viruses and toxins) biological sensors.

### ***TTA-2: Rapid Automated Biological Identification System (RABIS)***

This “detect-to-protect” system will be capable of continuous indoor monitoring of buildings and selected outdoor locations. The system will contain fully autonomous, broad spectrum (bacteria, viruses and toxins) sensors capable of identifying biological agents with a response time that provides sufficient warning to enable effective protection by limiting exposure.

## 1.2 Systems for Chemical Countermeasures

### ***TTA-3: Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM)***

This “detect-to-warn” system will be capable of continuous monitoring of facilities for the presence of chemical warfare agents (CWAs) and high priority toxic industrial chemicals (TICs). The system will be fully autonomous and capable of detecting dangerous levels of these chemicals with a response time that provides sufficient warning to enable effective protection by limiting exposure.

#### ***TTA-4: Lightweight Autonomous Chemical Identification System (LACIS)***

This will be a fully autonomous, hand portable, detection system for CWAs and high priority TICs. The lower limit of detection and response time of this detector will provide first responders with a tool to determine areas having dangerous concentration levels of these chemicals and to determine if protective garments will be required for their activities.

#### ***TTA-5: Portable High-throughput Integrated Laboratory Identification System (PHILIS)***

This system will be rapidly deployable in the field and capable of analyzing thousands of samples per day in order to identify chemically contaminated areas. The lower detection limit will meet or be lower than the Environmental Protection Agency (EPA) permissible exposure limits (PELs) for the presence of CWA and TIC contamination.

### **1.3 Program Summary**

The DSBCC Program will require innovation and capability in multiple disciplines including microbiology, chemistry, biochemistry, electronics, engineering, mathematics and related analytical sciences. In order to best accomplish the goals of the DSBCC Program, HSARPA anticipates bidders will consist of Teams which may include academic institutions, Government laboratories including Federally Funded Research and Development Centers (FFRDCs), and private sector organizations to develop the next generation of detector systems in each of these Technical Topic Areas (A small set of DOE laboratories, listed in Appendix C, is excluded from submitting responses to this solicitation). These new systems may require the development of new technologies, novel techniques for system integration, and innovative industrial teaming. The DSBCC Program, in the phased program approach described in this document, will develop and evaluate the most promising candidate technologies to provide the next generation of chemical and biological detectors for field testing and evaluation. The DSBCC Program strongly encourages the inclusion of promising technologies which are on parallel development paths being supported by other Government Agencies which could be incorporated into later phases of the program or during the course of production and/or as part of Pre-Planned Product Improvements (P3I). A primary goal of the DSBCC Program is to maximize the capabilities of future detection systems employed for biological and chemical countermeasures, while simultaneously optimizing their total ownership cost.

A critical element of the DSBCC Program is to enable the use of Teams that cut across organization boundaries to achieve optimal mixes of technical talent and innovation. To facilitate this teaming, the awards in this program will be executed as an "Other Transactions for Prototypes" (OT) under Section 831(a) (2) of the Homeland Security Act of 2002. This flexible authority permits wide latitude in tailoring business, organizational, and technical relationships to achieve the program goals. This tool allows the flexibility to use business and technical practices as desired. As a byproduct, it also

has important implications for the structure of this solicitation, the breadth of issues prospective offering teams must consider, and the actual proposal structure itself.

A final deliverable for each of the Phase I awards is a technical and cost proposal to execute Phase II. Exploiting the flexibility of the Other Transactions authority, HSARPA may elect to fund the Phase II proposals without further competition.

Teams are invited to prepare proposals to address one or more of the 5 TTAs described in Section 3, “System Performance Goals,” below. Teams must prepare separate proposals if they wish to address more than one TTA. Multiple awards are expected to be made to Teams for the initial Design Concepts Phase (Phase I) for each TTA. The table below provides the expected duration of the first Phase and an estimate of the anticipated upper value of individual awards under this solicitation. Proposals will be evaluated for cost realism and best value to the government.

<i><b>TTA</b></i>	<i><b>Phase I Duration</b></i>	<i><b>Anticipated Upper Value of Individual Awards</b></i>
TTA-1 BAND	18 Months	\$4.5M
TTA-2 RABIS	Phase IA 3 Months/Phase IB 15 Months	\$250K*
TTA-3 ARFCAM	9 Months	\$1M
TTA-4 LACIS	12 Months	\$600K
TTA-5 PHILIS	9 Months	\$300K

\*TTA-2 funding is for 3 month duration Phase IA.

## **2. PROGRAM OBJECTIVES AND APPROACH**

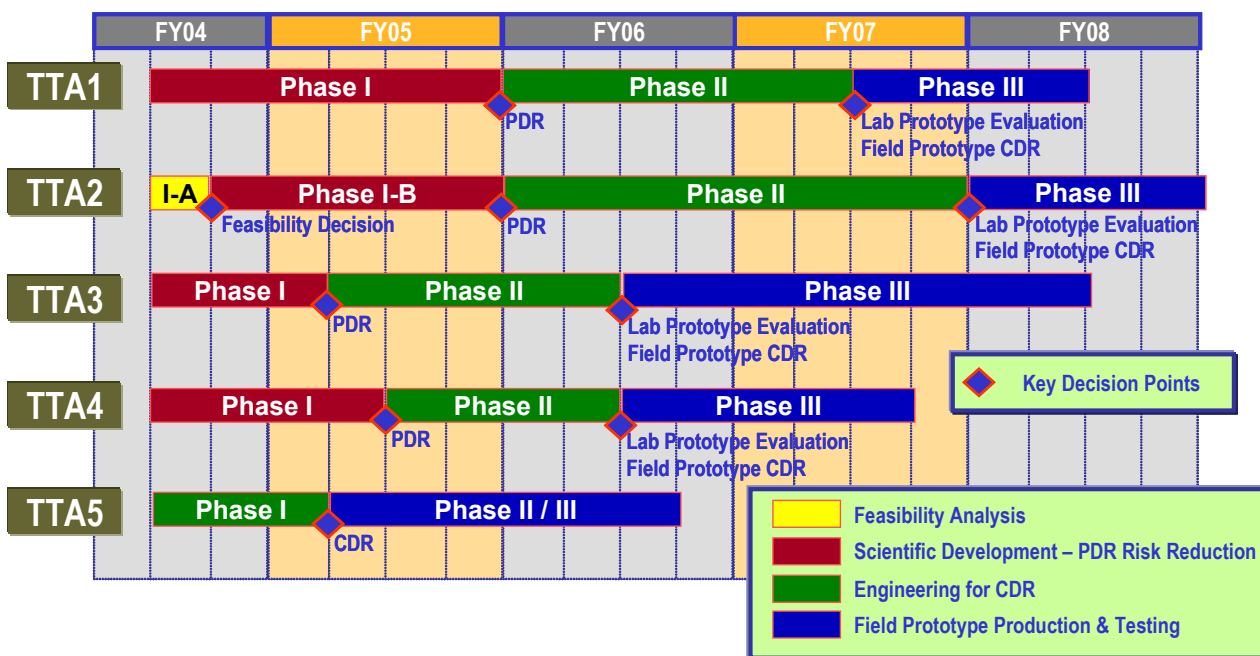
The objective of the HSARPA DSBCC Program is to provide the next generation of biological and chemical detectors required to effectively counter potential biological and chemical attacks on the homeland.

HSARPA anticipates making multiple awards under this solicitation in a phased development approach. Each detection system development program will proceed in three successive phases, with continuation between phases based on an independent technical evaluation, funds available and other programmatic considerations. In Phase I (the focus of this solicitation), HSARPA anticipates making multiple awards to explore different Team approaches to each of the TTAs described in Section 3 below.

## 2.1 Program Schedule and Phases

The Phase I efforts for each of the TTAs will result in a Preliminary Design with the key technical challenges validated during Phase I by a combination of simulation and laboratory demonstration. A more detailed discussion of Phase I, including specific criteria for the Phase I demonstration for each of the individual TTAs will be discussed in Section 4. At the end of Phase I, the Teams will also submit a detailed work plan, including a Statement of Work, and technical and cost proposal for conducting their Phase II effort. Based upon a review of these Phase I deliverables, related development efforts in other programs nationwide, and funds available, HSARPA will select projects for continued development in Phase II. The lead organization from Phase I may choose to propose a different set of members for the Phase II Team, deleting or adding members as required.

### *Notional Schedule*



During Phase II, the successful candidate Teams will develop and demonstrate a laboratory research prototype which will be evaluated relative to the performance criteria for each TTA delineated in Section 3. The Phase II work will culminate in a Critical Design Review for a fieldable prototype with well-defined performance specifications. In addition, Phase II Teams will develop a detailed Advanced Development Plan (ADP) for work to be conducted during Phase III.

During a Phase III effort one or more fieldable prototypes of the detection systems will be developed for use in a potential Pilot Demonstration beginning in FY2008 or sooner and a clear path to transition this technology to commercialization will be established.

### **2.1.1 TTA-1: Bioagent Autonomous Networked Detectors (BAND)**

The Phase I effort for TTA-1 must demonstrate through a combination of analysis and laboratory validations, the basic scientific elements required to support the Preliminary Design Review (PDR) for the laboratory prototype to be developed in Phase II. This should include at a minimum a validation of the sensitivity, estimated probability of detection, estimated false alarm rate and an analysis of the cost of ownership.

In Phase II, the scientific evaluation initiated during Phase I will be carried forward to a level of engineering detail to support a Critical Design Review (CDR) for a field prototype at the close of Phase II. As part of the Phase II effort, a functional laboratory prototype will be developed to demonstrate critical end-to-end performance issues associated with the Phase III field prototype concept.

During Phase III, the Teams will produce one or more field prototypes and participate in an extensive set of field trials.

### **2.1.2 TTA-2: Rapid Automated Biological Identification System (RABIS)**

The Phase I effort for TTA-2 must demonstrate through a combination of analysis and laboratory validations, the basic scientific elements required to support the PDR for the laboratory prototype to be developed in Phase II. Because of technical challenges involved in developing TTA-2, the Rapid Automated Biological Identification System (RABIS), the Phase I effort will be split into two sub-phases, beginning with a short (3 month) feasibility analysis. During the Phase I-A RABIS feasibility analysis, Teams will assess the overall technical feasibility of TTA-2 and produce a detailed research plan identifying the key scientific and technical issues which must be addressed to achieve the goals for the RABIS, with the intent of developing a Phase I-B plan resulting in a preliminary design for the RABIS in 15 months or less. Based upon the Phase I-A feasibility analysis and the plans refined during Phase I-A to execute during Phase I-B, HSAPRA may elect to fund Phase I-B and follow-on phases. The Phase I PDR should also include, at a minimum, a validation of the sensitivity, estimated probability of detection, estimated false alarm rate and an analysis of the cost of ownership.

In Phase II, the scientific evaluation initiated during Phase I will be carried forward to a level of engineering detail to support a CDR for a field prototype at the close of Phase II. As part of the Phase II effort, a functional laboratory prototype will be developed to demonstrate critical end-to-end performance issues associated with the Phase III field prototype concept.

During Phase III, the Teams will produce one or more field prototypes and participate in an extensive set of field trials.

### **2.1.3 TTA-3: Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM)**

The Phase I effort for TTA-3 must demonstrate through a combination of analysis and laboratory validations, the basic scientific elements required to support the PDR for the laboratory prototype to be developed in Phase II. This should include at a minimum a validation of the sensitivity, estimated probability of detection, estimated false alarm rate and an analysis of the cost of ownership.

In Phase II, the scientific evaluation initiated during Phase I will be carried forward to a level of engineering detail to support a CDR for a field prototype at the close of Phase II. Field demonstration of the required wireless interface of LACIS with the Scene Control Unit (SCU) will occur during Phase II. As part of the Phase II effort, both a field prototype LACIS system and a laboratory prototype SCU will be employed to demonstrate critical end-to-end performance issues associated with the Phase III effort.

During Phase III, the Teams will produce one or more field prototypes and participate in an extensive set of field trials.

### **2.1.4 TTA-4: Lightweight Autonomous Chemical Identification System (LACIS)**

The Phase I effort for TTA-4 must demonstrate through a combination of analysis and laboratory validations, the basic scientific elements required to support the PDR for the LACIS laboratory prototype to be developed in Phase II. This should include at a minimum a validation of the sensitivity, estimated probability of detection, estimated false alarm rate and an analysis of the cost of ownership. Sufficient laboratory data must be provided to support the required sample processing from collection to disposal.

In Phase II, the scientific evaluations initiated during Phase I will be carried forward to a level of engineering detail to support a CDR for a field prototype at the close of Phase II. Field demonstration of the required wireless interface of at least ten LACIS units with the Scene Control Unit (SCU) will occur during Phase II. As part of the Phase II effort, both a LACIS system and a functional SCU laboratory prototype will be developed to demonstrate critical end-to-end performance issues associated with the Phase III field prototype concept.

During Phase III, the Teams will produce one or more field prototype systems and participate in an extensive set of field trials of both the LACIS and SCU.

### **2.1.5 TTA-5: Portable High-throughput Integrated Laboratory Identification System (PHILIS)**

For TTA-5, the initial Phase will be a study resulting in a detailed design presented at a Critical Design Review. Based upon an evaluation of the TTA-5 CDRs, HSARPA will select one or more Teams to produce one or more field prototypes during Phase II/III.

## **2.2 Government Furnished Equipment and Resources**

In support of the Technical Topic Areas (TTAs), the Government will consider requests by Teams to provide test and probe materials from other government programs. Teams should identify any requested Government Furnished Resources as part of their white paper submission and must explicitly provide these requirements as part of their Full Proposals.

## **3. SYSTEM PERFORMANCE GOALS**

### **3.1 Biological Countermeasures Technical Topic Areas (TTAs)**

#### **3.1.1 TTA-1: Bioagent Autonomous Networked Detectors (BAND)**

The Department of Homeland Security, in conjunction with the Environmental Protection Agency (EPA) and the Centers for Disease Control (CDC), is currently operating urban bioaerosol monitors in many cities as part of the BioWatch program. The first generation BioWatch System consists of distributed air samplers requiring daily manual retrieval of filters which are subsequently analyzed in CDC's Laboratory Response Network (LRN) laboratories. The goal is to improve this system by developing automated, distributed detectors so that further laboratory analyses of samples are only required when presumptive positive detection events have been reported.

This improvement plan requires the development of fully autonomous, multiplexed detection systems capable of continuous (24 hour) monitoring that can be distributed throughout cities in a "detect-to-treat" mode. Deployed outdoors in an urban area, these detection systems are anticipated to continuously sample the air, extract aerosol particulates, and analyze them at least once every three hours, providing an integrated detection of any airborne bioagent released within the preceding three hour window. Alternative technical approaches that would provide equivalent detection capabilities will also be considered as part of this solicitation.

Initial studies of the BioWatch program and of facility monitoring architectures, as well as preliminary evaluation of alternate architectures, suggest the following attributes as goals for the Autonomous Networked Detectors.

#### ***Performance Targets***

- 1) Continuous (24 hours/day, 365 days per year), fully autonomous operation including sample collection, preparation, analysis, waste handling, and cleaning between analyses if needed. Integration sampling window of three hours or less, with results of the analyses provided within one hour after the end of the sampling period.

- 2) Ability to simultaneously analyze for a minimum of 20 agents, including threats from CDC's Category A and B agents list (refer to Appendix A).
- 3) Limit of Detection (LOD) for bacteria/viruses of 100 collected organisms during the three hour integration time based upon an assumption of a 100 liter per minute air collector at 90% efficiency. For toxins the LOD is a cumulative collection of 10 nanograms of toxin under the same air collection assumptions. Proposed system concepts may adopt alternative air collection rates or novel alternative concepts, but must be scaled to meet the same LOD.
- 4) Exhibit, for each agent, a false positive rate of  $< 10^{-7}$  required and  $< 10^{-8}$  desired, based upon a 3 hour sample interval.

### ***Cost of Ownership***

- 5) Acquisition costs, in quantities of 1,000, of \$25,000/unit or less.
- 6) Operation costs, including maintenance, spare parts, and consumables, of \$10,000/year or less.

### ***System Characteristics***

- 7) Capability to preserve all samples collected within the previous 5 days, for further confirmatory and forensic analyses.
- 8) Robust wireless communication of analytical results and of the functional status of the system, to include remote failure diagnosis and troubleshooting of control software and remote capability of initiating a sampling cycle via a timed sequence, an independent sensor trigger, or an external command.
- 9) Required maintenance intervals, including replenishment of consumables, exceeding one month.
- 10) Ability to operate in the full range of typical indoor and outdoor environments using standard power, including robustness against power interruption.
- 11) Packaged into a modest footprint (ex: 2 cubic foot volume) with a minimum of specialized environmental and logistical requirements.

The performance targets, cost of ownership and system characteristics goals we seek to achieve for the BAND systems are very ambitious. Teams are asked to propose concepts which will simultaneously meet as many of the preceding goals as possible in priority of performance, cost of ownership and system characteristics. Teams are encouraged to

submit concepts which best meet the greatest number of the goals, clearly articulating the technical limitations where the goals can not be met.

### **3.1.2 TTA-2: Rapid Automated Biological Identification System (RABIS)**

A key element for defending against bio-terrorism is the development of “detect-to-protect” systems for monitoring facilities (both indoor and outdoor). These systems must respond rapidly enough to enable corrective actions to minimize individual exposure to bioagents. One mode of operation for the detection system would be to mount it directly in the central plenum of the Heating, Ventilation and Air Conditioning (HVAC) zone and measure the concentration of airborne bioagents. In this mode of operation the RABIS systems would need to provide a warning alert within one or two minutes after the bioagent has entered the HVAC zone.

Initial studies of the BioWatch program and of facility monitoring architectures, as well as preliminary evaluation of alternate architectures, suggest the following attributes as goals for the Rapid Automated Biological Agent Identification System.

#### ***Performance Targets***

- 1) Continuous (24 hours/day, 365 days per year), fully autonomous operation including sample collection, preparation, analysis, waste handling, and cleaning between analyses if needed. Capable of collecting and analyzing a new sample every two minutes (or less) continuously when mounted in an HVAC zone of a building.
- 2) Ability to simultaneously analyze for a minimum of 20 agents, including threats from CDC’s Category A and B agents list (refer to Appendix A).
- 3) Limit of Detection (LOD) for bacteria/viruses of 100 organisms per liter of air with an integration time of up to two minutes. For toxins the LOD is a concentration of 0.05 nanograms per liter of air of toxin.
- 4) System false positive rates of less than once per month with a goal of once per year.

#### ***Cost of Ownership***

- 5) Acquisition costs, in quantities of 100, of \$50,000/unit or less.
- 6) Operations costs, including maintenance, spare parts, and consumables, of \$20,000/year or less.

#### ***System Characteristics***

- 7) Capability to preserve positive samples for further confirmatory and forensic analyses.
- 8) Robust wireless communication of analytical results and of the functional status of the system, to include remote failure diagnosis and troubleshooting of control software and remote capability of initiating a sampling cycle via a timed sequence, an independent sensor trigger, or an external command.
- 9) Required maintenance intervals, including replenishment of consumables, exceeding one month.
- 10) Ability to operate in the full range of typical indoor and a more limited set of outdoor environments, using standard power, including robustness against power interruption.
- 11) Packaged into a modest footprint (ex: 2 cubic foot) with a minimum of specialized environmental or logistical requirements.

The performance targets, cost of ownership and system characteristics goals we seek to achieve for the RABIS are very ambitious. Teams are asked to propose concepts which will simultaneously meet as many of the preceding goals as possible in priority of performance, cost of ownership, and system characteristics. Teams are encouraged to submit concepts which best meets the greatest number of the goals, clearly articulating the technical limitations where the goals can not be met.

## **3.2 Chemical Defense Technical Topic Areas**

### **3.2.1 *TTA-3: Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM)***

The capability to detect and respond to a chemical threat within enclosed spaces, such as buildings, transportation facilities, etc., is a key component of the defense against terrorist use of chemical warfare agents and Toxic Industrial Chemicals (TICs). Since the physiological response to some of these agents can be very rapid, a system of detectors that provides rapid response without human action is required. The essential functions of such a system are to provide a highly reliable, rapid alarm indication of the threat in environs near the area of release, and it should be capable of triggering appropriate response measures, however, this response is not part of this RA. The component sensors of the system should be located to assure the most complete and rapid overall system response.

In addition to providing spatial coverage of the threat, the system and its detectors must be responsive to a large range of toxic chemical materials of potential use by terrorists. It must be able to respond to concentrations that present an acute hazard as well as to those whose average over time presents a toxic dose. Chemicals of interest include the traditional chemical warfare blood, vesicant, nerve, choking, and blister agents as well as

TICs. A typical list of these analytes is found in Appendix B. Phase I awardees will be provided with a more detailed list of agents.

Incorporation of components to preserve chemical materials for later laboratory analysis will enable effective post-event characterization.

Next-generation systems must expand the number of detectable chemical hazards without a concomitant increase in the number of different types of sensors incorporated in the system. The confidence level associated with response of the system as well as its component sensors must be very high against a background of potentially confounding ambient changes.

Desired attributes of ARFCAM include:

### ***Performance Targets***

- 1) Continuous operation (24hours/day, 365 days/year), fully autonomous operation (including sample collection, preparation, analyses, waste handling, sample storage, and any routine instrumentation preventative maintenance such as cleaning, standardization, calibration) in any building (e.g., fully or partially enclosed facility) in environments with ambient temperatures of 10 deg C to 60 deg C and relative humidity of 0% to 90%, with response times of one minute or less at Immediate Danger to Health and Life (IDHL) level concentrations and within 15 minutes or less at Permissible Exposure Limits (PEL) level concentrations (Appendix B).
- 2) Ability to detect and identify simultaneously up to twenty different chemical hazards, including the traditional chemical warfare blood, vesicant, nerve, choking, and blister agents as well as TICs including those provided in Appendix B. Phase I awardees will be provided with a more detailed list of agents.
- 3) No more than one false positive system response per year; false negative responses of < 5%. Routine maintenance required should not exceed more than once per six months.

### ***Cost of Ownership***

- 4) Acquisition cost, in quantity of 10,000, not to exceed \$1000 per detector in system. Annual cost of consumables (excluding utilities) averaging \$50 or less per detector in system. Service life of 3 years or more expected.

### **3.2.2 TTA-4: Lightweight Autonomous Chemical Identification System (LACIS)**

Current procedures for physical protection of responders to hazardous materials incidents require the use of protective gear until such time as the hazard can be assessed. This detection system is to serve as guidance for first responders in accord with local policy on when to don or remove protective gear. Operation in full physical protective equipment (PPE) can significantly degrade the functionality and operational effectiveness of responders as they assess the scene, conduct rescue operations, and initiate site cleanup. Overall effectiveness of first responders will be greatly enhanced through the use of this next-generation tool to provide accurate, near real-time analysis of the chemical hazards at an incident scene.

First responders have expressed the need for detection devices that can be carried into an incident scene to provide near real-time analysis in the vicinity of an individual responder. Such a device would provide single-person portable detection capabilities against the full spectrum of chemical hazards, to include chemical warfare agents and TICs. Like the ARFCAM, the LACIS should be capable of detecting up to twenty different chemicals (see Appendix B) with wide dynamic range, in a single piece of hardware. The LACIS would be used to support decisions related to the use of PPE and would assist, when operated as a component of a network, in the assessment of an overall scene by multiple responders.

Desired attributes of the Lightweight Autonomous Chemical Identification System (LACIS) include:

#### ***Performance Targets***

- 1) Ability to detect chemicals of interest including the traditional chemical warfare blood, vesicant, nerve, choking, and blister agents as well as TICs (including those provided in Appendix B) with a response time at the PEL level of 2 minutes or less, and false negatives of less than 1 in 1000; false positives of less than 1 in 100. Phase I awardees will be provided with a more detailed list of agents.

#### ***Cost of Ownership***

- 2) Acquisition costs, in quantities of 10,000, of \$2000 or less.

#### ***System Characteristics***

- 3) The desired unit size is approximately 0.50 cubic feet or less in volume and 5.0 lbs. or less in mass. The unit should be operated with no consumables other than batteries, which should be of commercial availability, and should become operationally stable within ten minutes or less after power-up from an idle, power-off state. The unit should have a wireless network capability to a central scene control

unit which simultaneously provides operational state and system status for a minimum of ten detectors.

### **3.2.3 TTA-5: Portable High-throughput Integrated Laboratory Identification System (PHILIS)**

In the event of a real or perceived large area outdoor release of chemically hazardous material, the extent of the area contaminated must be determined. This will require an ability to prepare and analyze quickly a large number of contaminated samples.

This system must be capable of detecting the traditional chemical warfare blood, vesicant, nerve, choking, and blister agents as well as TICs including those provided in Appendix B. Phase I awardees will be provided with a more detailed list of agents and TICs. The lower limits of detection must be at the EPA permissible exposure limits.

The overall system will include both a sample analysis area (PHILIS) and a Sample Preparation Area (SPA). The PHILIS will analyze samples obtained from a SPA (the SPA is also a component of this TTA). Successful PHILIS Phase I bidders will be asked to provide specifications for the SPA. It is anticipated that, in the event of an actual emergency, samples ranging from household items to deceased animals may require some level of analyses. Additionally, liquid samples (both aqueous and organic), solid samples (e.g., soil), vapor samples (e.g. air) and mixed state samples may arrive at the SPA for in-processing. Significant waste may be generated during sample preparation, and a system for handling this must be addressed in the offerer's response. The PHILIS unit, in order to maintain the desired >1000 samples a day analysis rate, will require specific input parameters for sample mass/volume. In turn, these specific parameters become the output specifications for the SPA. Thus one deliverable for the Phase I awards for PHILIS is the technical specifications for the SPA.

Desired attributes of PHILIS include:

#### ***Performance Targets***

- 1) The ability to analyze, prepare and report on at least 1,000 (vapor, liquid, solid, mixed state) samples per 24 hours operation, including identification of all chemical agents and TICs present within a given sample above the EPA PEL.
- 2) Automated sample tracking, processing, waste analyses, and data output, and identification of samples requiring re-analysis when they have tested positive for selected analytes.

#### ***System Characteristics***

- 3) The goal is to be a self-contained mobile unit (e.g., a typical delivery van), which operates with on-board power, is fully operational within

two hours or less of arrival at an incident location, requires no interfacing with local facilities other than for waste handling, and relies on commercially available consumables and components.

## **4. DELIVERABLES**

To the exclusion of exceptions negotiated at time of award, any of the deliverables associated with this Program may be released to outside organizations, both U. S. Government and non-Government, in support of DHS S&T efforts. The performer may recommend a preferred format for each deliverable, but the final format will be determined by the Government. For each Phase, monthly status reports are due within one week after the last day of each month; quarterly reports are due one week prior to the time of the quarterly reviews; and comprehensive Phase deliverables are due within two weeks of the conclusion of each Phase.

### **4.1 Phase I Deliverables**

#### **4.1.1 General comments**

This solicitation invites proposals for performance of the Design Concepts Phase of the DSBCC development program for each of the TTAs. Teams' proposals for performance of Design Concepts work should describe specifically how the offerer's team will perform the tasks required during this Phase. The following tasks described within this section are notional and viewed as the minimum required. General information required for all TTAs is listed first, and specific requirements for each TTA follow.

Brief (not more than one page) narrative reports will be electronically submitted to the Program Manager within one week after the last day of each month. These reports will describe the previous 30 calendar days' activity, technical progress achieved against goals, difficulties encountered, recovery plans (if needed), and explicit plans for the next 30 day period.

Quarterly reports (not to exceed 5 pages) will be electronically submitted to the Program Manager and are due one week prior to the time of the quarterly reviews. These reports will describe the previous 90 calendar days' activity, principals involved in the actual work of the period, technical progress achieved against goals, difficulties encountered, funds expended against each sub-task in the previous 90 day period, recovery plans (if needed), and explicit plans for the next 90 day period.

For a final report, each Team will provide a Technical Report of their work performed during Phase I, including a description of the system proposal for Phase II at a level of detail consistent with a preliminary design review. This will include performance predictions, a description of the design trades that resulted in the selected design, and an enumeration of remaining unknowns and uncertainties. This final report will be a cumulative, stand-alone document that describes the work of the entire Phase leading up to it. It should detail how the design concept was refined and why the refinement was

undertaken. It must include any technical data gathered, such as, measurements taken, models developed, simulation results, and formulations developed. This final report should also include “lessons learned” from the effort, recommendations for future research in this area, and a comprehensive and detailed account of all funds expended. Performers will develop a plan for Phase II & III, including: preliminary design of system prototype, an experimental plan for developing and testing the prototype; and an activity schedule and cost breakdown to carry out Phase II & III. Each Team will submit a detailed work plan, including a Statement of Work, for conducting their Phase II effort, should they be selected.

#### **4.1.2 TTA Specific Deliverables**

##### **4.1.2.1 TTA-1 Bioagent Autonomous Networked Detectors (BAND)**

The preliminary design provided at the close of Phase I must provide specific analysis demonstrating the anticipated level of performance for both the Phase II laboratory research prototype and the Phase III fieldable prototypes. Teams must also provide a detailed explanation of the differences in the anticipated performance characteristics of the Phase II laboratory system and anticipated performance of the Phase III prototype including a discussion of all relevant technical and programmatic issues in migrating from the Phase II to the Phase III goals.

##### ***Performance targets:***

Under performance targets, Teams must provide a scientifically sound explanation of the anticipated sensitivity through a combination of modeling and laboratory validation. For the detection sensitivity, explicit validation results must be provided for each threat type, which, depending upon technical approach, may be differentiated by spore, vegetative cell, toxin, DNA virus and RNA virus. If a high degree of PCR multiplexing is required this must be validated by experimental results.

Teams must also provide credible data which either demonstrates the anticipated false alarm performance, or from which a reasonable extrapolation to the anticipated false alarm performance is demonstrated. The false alarm analysis must incorporate both random noise sources and potential sources of environmental biological clutter.

##### ***Cost of ownership targets:***

Under the cost of ownership goals, Teams must provide a preliminary estimate of the anticipated costs to manufacture the proposed device in quantity following the Phase III demonstration. Teams must provide a detailed estimate of the cost of operation, explicitly identifying any assumptions or technical breakthroughs required. Teams must provide detailed estimates of any consumable costs including any license costs for proprietary reagents.

##### ***System characteristics:***

A preliminary analysis should be provided to indicate the anticipated system characteristics that will be achieved for the Phase II laboratory prototype and the Phase III field prototype.

#### **4.1.2.2 TTA-2 Rapid Automated Biological Identification System (RABIS)**

The TTA-2 Phase I effort is split into a three month duration Phase I-A effort followed by a Phase I-B of 15 month duration. Teams are expected to provide a proposal for the entire Phase I effort with the initial three months of Phase IA focused on proving the feasibility of the proposed approach, refining the research path to execute Phase I-B and providing an updated estimate of the cost to execute Phase I-B. HSARPA may elect to continue zero, one or more Phase I-B efforts after an evaluation of the Phase I-A products.

At the close of Phase I-B, the Teams must provide specific analysis demonstrating the anticipated level of performance for both the Phase II laboratory research prototype and the Phase III fieldable prototypes. Teams must also provide a detailed explanation of the differences in the anticipated performance characteristics of the Phase II laboratory system and anticipated performance of the Phase III prototype including a discussion of all relevant technical and programmatic issues in migrating from the Phase II to the Phase III goals.

##### ***Performance targets:***

Under performance targets, Teams must provide a scientifically sound explanation of the anticipated sensitivity through a combination of modeling and laboratory validation. For the detection sensitivity, explicit validation results must be provided for each threat type, which, depending upon technical approach, may be differentiated by spore, vegetative cell, toxin, DNA virus and RNA virus. If a high degree of multiplexing is required this must be validated by experimental results.

Teams must also provide credible data which either demonstrates the anticipated false alarm performance, or from which a reasonable extrapolation to the anticipated false alarm performance is demonstrated. The false alarm analysis must incorporate both random noise sources and potential sources of environmental biological clutter.

In Phase I-A, Teams must provide preliminary analysis which addresses these topics and define a clear plan to complete this task by the end of Phase I-B.

##### ***Cost of ownership:***

Under the cost of ownership goals, Teams must provide a preliminary estimate of the anticipated costs to manufacture the proposed device in quantity following the Phase III demonstration. Teams must provide a detailed estimate of the cost of operation, explicitly identifying any assumptions or technical breakthroughs required. Teams must provide detailed estimates of any consumable costs including any license costs for proprietary reagents.

In Phase I-A, Teams must provide preliminary analysis which addresses these topics and define a clear plan to complete this task by the end of Phase I-B.

***System characteristics:***

A preliminary analysis should be provided to indicate the anticipated system characteristics that will be achieved for the Phase II laboratory prototype and the Phase III field prototype.

**4.1.2.3      *TTA-3 Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM)***

***Performance targets:***

Details must be provided for: sample collection, sample preparation, sample analysis protocol (including: standards – frequency and identity, sensitivity, accuracy, precision, range, and analyte capacity), waste handling, sample storage, response times versus detection level plots, and false positive and false negative performance against the target set of analytes supplied.

***System characteristics:***

Details for preventative maintenance, operational limits (time, temperature, vibration, and humidity), footprint, and utilities requirements must be provided.

***Cost of ownership:***

Cost of ownership must be derived and defended with preliminary laboratory data.

**4.1.2.4      *TTA-4 Lightweight Autonomous Chemical Identification System (LACIS)***

***Performance targets:***

Details must be provided for: sample collection, sample preparation, sample analysis protocol (including: standards – frequency and identity, sensitivity, accuracy, precision, range, and analyte capacity), waste handling, sample storage, response times versus detection level plots, and false positive and false negative performance against the target set of analytes supplied.

***System characteristics:***

Details for preventative maintenance, operational limits (time, temperature, vibration, and humidity), footprint, and utilities requirements must be provided. Detailed list of all consumables required by the system, including suggested lifetimes for each. Details related to the interface of the sensor unit with the wireless SCU, including full specifications for spectrum, protocol, and likely interferences.

***Cost of ownership:***

Cost of ownership must be derived and defended with preliminary laboratory data.

**4.1.2.5      *TTA-5 Portable High-throughput Integrated Laboratory Identification System (PHILIS)***

***Performance targets:***

Details must be provided for: sample collection, sample preparation, sample analysis protocol (including: standards – frequency and identity, sensitivity, accuracy, precision,

range, and analyte capacity), waste handling, sample storage, response times versus detection level plots, and false positive and false negative performance against the target set of analytes supplied.

***System characteristics:***

Sample throughput must be specified and defended with preliminary laboratory data. Details for cold-start to full operation dwell times, preventative maintenance, operational limits (time, temperature, vibration, and humidity), footprint, and utilities requirements must be provided. Detailed list of all consumables required by the system, including suggested lifetimes for each. Details related to the interface of the PHILIS with the SPA, including all sample state (vapor, liquid, solid, mixed state) input, volumes, masses, and tracking. Details of the SPA operations concept, especially those related to achievement of the desired throughput.

***Cost of ownership:***

Cost of ownership must be derived and defended with preliminary laboratory data. Details of the employment of automation to meet the throughput requirements, likely cost of such automation, and identification of alternate strategies to accomplish these requirements, together with cost estimates for such system designs shall be delivered at the conclusion of Phase I.

## **4.2 Phase II Deliverables**

At a minimum, performers will provide monthly and quarterly reports, and a final report as described in Phase I, as well as the prototype and prototype design of the final system. A detailed systems design for the prototype, a functional description of the appropriate procedures for operation and maintenance, and the source code to use the prototype will also be delivered, if applicable. A detailed SOW for Phase III will be a deliverable from Phase II. Additional details related to deliverables expected from Phase II will be provided by HSARPA not later than six months after the award date of Phase I.

## **4.3 Phase III Deliverables**

At a minimum, performers will provide monthly and quarterly reports, and a final report as described in Phase II. One or more operational, fieldable units, complete with all operational manuals, design and construction specifications, will be provided not less than three months from the end of Phase III. Additional details related to deliverables expected from Phase III will be provided by HSARPA not later than six months after the award date of Phase I and may be updated again prior to the end of Phase II.

# **5. INFORMATION FOR OFFERORS**

## **5.1 Eligible Applicants**

Any entity, other than the specific Department of Energy Laboratories listed in Appendix C, may submit a white paper or proposal in accordance with the requirements and procedures identified in this Research Announcement (RA).

Teams, which may include academic institutions, Government laboratories including FFRDCs, and private sector organizations, are encouraged to respond with creative design concepts for the next generation of detector systems in each of these Technical Topic Areas.

Historically Black Colleges and Universities (HBCU), Minority Institutions (MI), small and disadvantaged businesses (SDB), women-owned businesses (WB), and HUB-zone enterprises are encouraged to submit proposals, and to join others in submitting proposals; however, no portion of the RA will be set-aside for these special entities because of the impracticality of reserving discrete or severable areas of research and development in the five technical topic areas listed above.

## **5.2 Eligibility for Awards Under Other Transactions Authority**

Section 831(a)(2) of the Homeland Security Act of 2002 (Public Law 107-296) gives the Department of Homeland Security (DHS) the same “Other Transactions for Prototypes” authority exercised by the Department of Defense (DoD) under 10 U.S.C. §2371 note. Section 831(a)(2) also imposes the same criteria for award of an “Other Transactions for Prototypes” agreement on DHS as was given to DoD.

In summary, these criteria require that:

- 1) there must be either at least one nontraditional government contractor participating to a significant extent in the prototype project; or,
- 2) if there is no nontraditional government contractor participating to a significant extent, at least one of the following circumstances exists:
  - i) at least one third of the total cost of the prototype project is to be paid with funds provided by parties to the transaction other than the Federal Government; or,
  - ii) the senior procurement executive determines that exceptional circumstances justify the use of a transaction that provides for innovative business arrangements or structures that would not be feasible or appropriate under a contract.

In this context, a “nontraditional contractor” is defined as:

- 1) an entity that has not, for a period of at least one year prior to the date that a transaction (other than a contract, grant, or cooperative agreement) for a prototype project under the authority of this section is entered into, entered into or performed with respect to –
  - i) any contract that is subject to full coverage under the cost accounting standards prescribed pursuant to section 26 of the Office of Federal

Procurement Policy Act (41 U.S.C. 422) and the regulations implementing such section; or

- ii) any other contract in excess of \$500,000 to carry out prototype projects or to perform basic, applied, or advanced research projects for a Federal agency, that is subject to the Federal Acquisition Regulation.

The Government has discretion in determining the level of “significant extent.” Some factors may include:

- 1) criticality of the technology being contributed
- 2) role of the non-traditional government contractor(s) in the design process
- 3) value of the effort being proposed

Contributions for items such as IR&D reimbursement, G&A, cost of money, and fee identified separately will meet the statutory cost-share requirement and are preferred to in-kind contributions. It is not the Government’s intention to encourage or require use of the cost share criteria. The Government prefers that the teams attempt to locate appropriate non-traditional team members before offering cost share. If the team cannot or chooses not to find nontraditional team members or provide cost share, the team may request a waiver of these requirements. In its white paper or proposal, the team should describe the innovative business arrangements or structures that would justify the exercise of such a waiver. The Government will consider all waiver requests but reserves the right to grant any, all or none of the requests at its discretion.

### **5.3 Proposing to one or more TTAs**

Offerors may propose to any, some or all of the five TTAs. Offerors proposing to more than one TTA should submit separate proposals. Responses to this RA are limited to one per individual principal investigator/program director/Team leader per TTA. Separate responses should be made for each TTA addressed.

### **5.4 Application and Submission Information**

Copies of this RA may be downloaded from the Technology Support Working Group (TSWG) BAA Information Delivery System (BIDS) web site: [www.bids.tswg.gov](http://www.bids.tswg.gov) . Paper copies of the RA may be obtained by contacting:

Booz Allen Hamilton,  
4001 Fairfax Drive, Suite 750  
Arlington, VA 22203  
POC: Steve Svensson 703 465-2628

## **5.5 Bidders Conference**

HSARPA intends to hold a Bidders Conference for the Detection Systems for Biological and Chemical Countermeasures RA on Monday, September 29, 2003 in Washington, DC. All interested attendees must register on line at <https://www.enstg.com/Register/passthru.cfm?RT123=DET49098>. The site includes directions to The Marriott Washington Wardman Park from local airports and names and contact information for area hotels. A \$40.00 registration fee will be collected at sign in. The point of contact for the Bidders Conference is

Donna Blanger  
Booz-Allen Hamilton  
4001 Fairfax Drive, Suite 750, Arlington, VA 22203  
703-465-5717  
[blanger\\_donna@bah.com](mailto:blanger_donna@bah.com)

## **5.6 Submitting a response to this RA**

HSARPA will use the TSWG BIDS to collect responses to this RA. All submittals must strictly follow the instructions in this announcement and include only the information specified to avoid delays in evaluation or potential disqualification.

### **5.6.1 BIDS**

The Broad Agency Announcement Information Delivery System (BIDS) in operation at [www.bids.tswg.gov](http://www.bids.tswg.gov) will be used to provide public access to the RA package and to collect all unclassified submittals under this RA. A BIDS Registration is not necessary to download the RA package. However, a Submitter Registration is required to respond to this RA and to upload submittal response data. The offeror must complete all mandatory fields on the submitter registration form in BIDS including a User Name that will be used for login and as part of the Document Identifier for submissions, described later in this RA package. Registration acceptance for submitters is automatic and will be transmitted by email to the registrant, indicating the User Name entered during registration for login. This process may take a few minutes to be recognized by BIDS. Questions regarding BIDS may be addressed via email to TSWG at [bidshelp@tswg.gov](mailto:bidshelp@tswg.gov) or by accessing the HELP REQUEST at the bottom of the BIDS Home Page. The email address for a specific User Name in the BIDS registration serves as the notification point for all email correspondence to that user and will be the point of contact for the Government Contracting Officer.

### **5.6.2 Submitting Classified Proposals**

HSARPA anticipates that most proposals submitted in response to this RA will be unclassified. If an offeror wishes to submit a proposal containing classified information, it must be submitted via proper classified courier or proper classified mailing procedures as described in the National Industrial Security Program Operating Manual (NISPOM).

Classified documents MUST be received by the applicable due date and time. Classification does not eliminate the requirement for offerors to comply with all instructions and deadlines in this RA. For additional instructions with regards to the submission of classified proposals, contact:

DHS/HSARPA  
Rob Sullivan  
[robert.c.sullivan@dhs.gov](mailto:robert.c.sullivan@dhs.gov)  
202-772-9889

### **5.6.3 Document Identifier**

The submitter must insert a “Document Identifier” into the header (top margin area) of each submittal. The identifier must be unique to any other submittal from the offeror in BIDS and MUST be formatted with the prefix HSARPA, the TTA number, the User Name and the submitter internal tracking number. The constructed document identifier is frequently used by the evaluation team to identify each submittal and to connect downloaded/printed documents with evaluation records posted into on-line collaboration software.

For example, Document Identifiers are formatted as follows:

**HSARPA-TTA-1-UserName-Submitter Internal Tracking Number**

Note: When actually uploading a submission to the TTA requirement in BIDS (on-line), the appropriate prefix (underlined in the example) is automatically generated by the system and attached to the submitter internal tracking number which is unique and the only number created by the submitter at the time a submittal record is created. The document identifier inserted into the header of the uploaded document MUST match the document identifier in the on-line BIDS system. Classified submission documents, although not uploaded to BIDS, must also include the Document Identifier as generated in BIDS when the submission (tracking) record is created.

The system enforces unique tracking numbers for each submission and will not allow an upload of a submittal document if the Submitter Internal Tracking Number has already been used. A submitter internal tracking number could be the date the document was submitted followed by the letters FP or other alphanumeric designation by the submitter.

### **5.6.4 BIDS Proprietary Protection**

All data uploaded to BIDS is protected from public view or download. All submissions will be considered proprietary/source selection sensitive and protected accordingly. Documents may only be reviewed by the registrant, authorized Government representatives, and assigned evaluators

## **5.7 Security**

It is anticipated that some aspects of this project may require access to classified information. The goals under this solicitation are currently unclassified. In the future, the DHS may choose to classify systems performance developed under this initiative. Bidders to this RA will need to include a plan to handle SECRET level material by the end of Phase I.

## **5.8 Solicitation and Awards Schedule**

HSARPA plans to review all white papers no later than 14 calendar days after their due date. After the white paper review, HSARPA, at its discretion, will notify offerors, electronically or in writing, either encouraging or discouraging submission of full proposals based on the white paper.

HSARPA plans to review all proposals not later than 49 calendar days after their due date. Proposals will be evaluated by a review panel using the criteria specified under Evaluation Criteria in Section 6.0. Following this review offerors will be notified if their proposal has been selected for negotiation.

### **Submission Dates and Times**

<b><i>DATE</i></b>	<b><i>EVENT</i></b>
12 Sept 2003	FedBizOpps announcement published
29 Sept 2003	Bidders Conference
24 Oct 2003	White Papers due @ 4PM EDT
07 Nov 2003	White Paper Review completed
05 Dec 2003	Proposals due @ 4:00PM EDT
23 Jan 2004	Source selection completed. Contract negotiations.
March 2004	Kickoff meetings

Full proposals will be accepted only after the white paper deadline.

## **5.9 Proposal and White Paper Guidance and Content**

### **5.9.1 White Papers**

Offerors are strongly encouraged, but not required, to submit white papers in advance of full proposals.

White papers should capture the essence of a proposal and are designed to permit offerors to obtain feedback from HSARPA on their planned technology development without having to go to the expense and effort of writing a complete proposal. If received by the white paper submission deadline, the white paper will be evaluated by a review panel

comprised of government employees and government contractors specially selected to eliminate potential conflicts of interest. After this review, offerors will be promptly notified either encouraging submission of a full proposal or discouraging submission of a complete proposal. A White Paper may consist of not more than six pages including all pictures, figures, tables, and charts in a legible size.

The Government intends to use employees and subcontractors of a support contractor to assist in administering the evaluation of white papers and proposals. These personnel will have signed, and will be subject to, the terms and conditions of non-disclosure agreements. Bidders may request a government only review, but must indicate so on the cover page of the white paper and proposal.

***Format and size limitations:***

A white paper is an electronic file written in Microsoft Word 2000 (minimum 12 point font size and not less than single line spacing) or PDF format, readable by IBM-compatible PCs. Graphic images inserted into the file should be in a format (such as GIF or JPEG) that minimizes file size and supports clear display and document printing. The individual file size must be no more than 500Kb.

The White Paper should contain the following information in the following order:

- Administrative information
- Executive Summary
- Technical Content
- Personnel and Performer Qualifications and Experience
- Cost Summary for Phase I

***Organization***

***Administrative information:***

- Title, and Submitter's Proposal Serial Number (optional)
- Prepared in response to: HSARPA-RA0103-20030923
- The Specific Technical Topic Area, as identified in the RA, addressed in this White Paper (an offeror may address more than one Specific Technical Topic Area of the RA, but each submission requires a separate White Paper)
- Team Leader's names, organization, complete mailing address, email address, and voice and fax telephone numbers.
- Estimated total (direct and indirect) funding required for Phase I and Phase II.

***Executive Summary***

Provide a concise description of the scientific, technical, engineering and management approach you propose to address the TTA. Describe the various components of the

system proposed and relevant details about how they will function together. Point out what is unique about your proposed solution.

### ***Technical Approach***

#### ***Phase I:***

Describe the basic scientific or technical concepts that will be used in each component or subsystem comprising your proposed solution to the problem described in the TTA. What is unique about your solution and what advantages might it afford compared to alternate approaches other workers in this field have taken? What has been the extent of your team's past experience in working with or developing the technologies comprising your system?

Explain the performance your proposed solution can be expected to meet measured against each of the specific technical attributes and performance requirements described in the Topic Area section of the RA. What are the key scientific, technical, or engineering challenges and the timing for each that must be met in order to successfully complete this project?

Describe all required material, such as probes or simulant test materials, which must be provided by the Government to support the proposed work.

Provide a brief summary of the costs to execute Phase I, summarized by task.

#### ***Phase II:***

Explain your concept of how you will develop and demonstrate a laboratory prototype if you are awarded Phase II funding.

Point out the critical path technologies or key technical challenges you will face when building this prototype and your plans for meeting these challenges.

Explain how you will demonstrate the Phase II laboratory prototype performance relative to the performance and cost goals described in the RA.

### **5.9.2 Full Proposals**

Following the white paper deadline, bidders may begin submitting proposals which must be submitted prior to the proposal deadline. Although white papers are strongly encouraged, bidders may submit a proposal without a preceding white paper.

Proposers can choose to alter their ideas, concepts, technical approaches, etc. or expand on their original ideas between submission of a white paper and submission of the full proposal. Discussion, suggestions, or advice between the Government and offerors on white paper topics is not binding. Proposers are free to submit a full proposal without

regard to any feedback or advice about white papers that they may have received. Even if the feedback from the Government in response to the white paper is that a proposal based on the offered idea is unlikely to receive funding, a full proposal may still be submitted and will be evaluated uniformly with others.

Proposals consist of two separate electronic documents described in detail below. The first electronic file contains all technical information and is titled Volume I, Technical and Management Proposal. The second electronic document displays all cost information and is titled Volume II, Cost Proposal.

The two volume proposal is written in Microsoft Word (minimum 12 point font size and not less than single line spacing) or PDF for IBM-compatible format or, if more convenient for Volume II, Microsoft Excel. The submission of other supporting materials with the proposal is strongly discouraged and if submitted, will not be reviewed. Volume I, Technical and Management Proposal shall not exceed twenty-five (25) pages. There is no page limit on Volume II. The twenty-five page limitation for Volume I includes all pictures, figures, tables, and charts in a legible size. Graphic images inserted into the file should be in a format (such as GIF or JPEG) that minimizes file size and support clear display and document printing. Multiple files may be submitted for each volume of the proposal so long as the 25 page limit is observed for Volume I. Nonconforming proposals may be rejected without review.

### ***5.9.3 Volume I, Technical and Management Proposal (25 page limit \*A-E included)***

#### ***Section I. Official Transmittal letter:***

Official transmittal letter with authorizing official signature. For an electronic submission, the letter can be scanned into the electronic proposal.

#### ***Section II. Abstract of Proposal:***

A one page synopsis of the entire proposal including costs.

#### ***Section III. Proposal:***

This section describes the proposed work and the associated technical and management issues.

- A. Ability of proposed concept to meet the desired attributes and performance goals. This section is the centerpiece of the proposal and should describe the overall concept and how it will meet the desired attributes and performance goals specified in the RA.
- B. Technical Approach for Phase I. Identifies the critical technical issues in establishing the feasibility of this concept, and describes the plans and tests for establishing this feasibility during the duration of the Phase I effort.

- C. Technical Approach for Phase II. Provide a preliminary description of the Phase II effort, including when applicable, the design of the laboratory prototype, subsystem by subsystem, its principles of operation and the approaches for developing and testing the prototype, including Gantt charts and milestones.
- D. Schedule and milestones. Provides an integrated display for the proposed research, showing each task in Phase I, including major milestones. Include a notional schedule for Phase II with anticipated milestones.
- E. Deliverables. Describe all deliverables proposed under this effort, including data, software, hardware, and reports consistent with the objectives of the work involved. Include in this section all proprietary claims to results, prototypes, intellectual property, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims; so state. The Government expects to retain, at a minimum, Government Purpose Rights to results of funded efforts. If the offeror plans to restrict licensing rights to software, data or hardware, the rationale for so doing should be explained in full.
- F. Management Plan and Key personnel.\* Describes how the total team effort will be managed and provides rationale for participation of key team members. Provide CVs for each of the key personnel.
- G. Relevant Past Experience.\* Presents the proposer's previous accomplishments and work in this and closely related research areas.
- H. Facilities.\* Describes key facilities that will be used in the proposed effort.
- I. Requirements for Government Furnished Resources.\* Describe all required material, such as probes or simulant test materials, which must be provided by the Government to support the proposed work.
- J. Security Plan.\* Describes the rationale for what aspects of the work, if any, need to be protected, at what level, and propose a strategy for doing so.
- K. Cost Summary.\* Summarizes the projected costs for each task in each year of the effort, total cost and cost share, if any. Include separate break outs of subcontracts, man hours, task summaries, quarters and consumables, not to exceed two pages in length.

\* Sections F-K are excluded from 25 page count limit.

#### **5.9.4 Volume II, Cost Proposal**

The Cost Proposal will include:

Cover Sheet

This will include (as applicable):

- (1) Name and address of offeror;
- (2) Type of organization (same as used to register at [www.bids.tswg.gov](http://www.bids.tswg.gov));
- (3) Data Universal Numbering System (DUNS) (see [www.dnb.com/US/duns\\_update/index.html](http://www.dnb.com/US/duns_update/index.html));
- (4) OSHA Standard Industrial Classification (SIC) number [available at [www.osha.gov/oshstats/sicesr.html](http://www.osha.gov/oshstats/sicesr.html)];
- (5) Commercial and Government entity (CAGE) code (see [www.dlis.dla.mil/](http://www.dlis.dla.mil/));
- (6) Taxpayer Identification Number (TIN) (may be obtained from the IRS by calling 800-829-1040);
- (7) Federal Interagency Committee on Education (FICE) number (for educational institutions);
- (8) Proposal title;
- (9) Estimated total cost to complete research effort by initial award;
- (10) Proposed start date;
- (11) Proposed duration of effort;
- (12) Name, title, address, e-mail and telephone number and FAX number of offeror's Principal Investigator;
- (13) Name, title, address, e-mail and telephone number and FAX number of offeror's Administrative Representative;
- (14) Name, title, address, e-mail and telephone number and FAX number of offeror's Authorized Representative.

### ***Proposed Agreement w/ Attachments***

As part of the Cost Proposal, Teams are required to submit a signed agreement. The agreement is meant to provide an idea of the terms and conditions. It is likely that other terms and conditions may be negotiated before award but a signed agreement is required to ensure the offering Team has shaped the terms and conditions into a final form. Teams can propose any changes, additions or deletions to the Model Agreement (sample Model Agreement attached) that should be considered during agreement negotiations. Fully explain the rationale for the changes made in an addendum to the Agreement. Rationale located in other areas of the solicitation response may be cross-referenced.

### **Cost Response**

The cost response should be in the offeror's format. Detailed Bases of Estimates are not required. Certified cost or pricing data are not required. However, in order for the government to determine the reasonableness, realism and completeness of the cost proposal, the following data must be provided for each team member and in a cumulative summary:

Labor: Total labor includes direct labor and all indirect expenses associated with labor, to be used in the Phase I period of performance. Labor hours shall be allocated to each work outline element and segmented by team member. A labor summary by work outline is required. Provide a breakdown of labor and rates for each category of personnel to be used on this project.

Direct Materials: Total direct material that will be acquired and/or consumed in the Phase I period of performance. Limit this information to only major items of material and how the estimated expense was derived. For this agreement, a major item exceeds \$250,000. Material costs shall be assigned to specific work outline elements.

Subcontracts: Describe major efforts to be subcontracted, the source, estimated cost and the basis for this estimate. For this agreement a major effort exceeds \$250,000. Subcontract labor and material shall be accounted for per the two paragraphs above. A summary chart showing each major subcontractor labor and material effort by work outline is required.

Travel: Total proposed travel expenditures relating to the Phase I period of performance. Limit this information to the number of trips, location, duration, and purpose of each trip.

Other Costs: Any direct costs not included above. List the item, the estimated cost, and basis for the estimate.

Remember the cost proposal should tell the story of how and why you are planning to complete your proposed SOW. Activities such as demonstrations required to reduce the various technical risks should be identified in the SOW and reflected in the cost proposal.

The offeror should provide a total estimated price for the major IR&D activities associated with the program. The offeror should state whether each program is a dedicated IR&D or if it is being pursued to benefit other programs as well.

### **Cost Share**

Cost sharing is neither required nor encouraged. Teams proposing cost share should identify the amount, timing, and source of funds and provide the supporting rationale for cost share. Costs shared by the team shall be allocated to each relevant work outline element.

## **5.10 Contact Information for Questions Regarding this Solicitation**

The applicable electronic address for all correspondence for this RA is:  
[HSARPA.Queries\\_about\\_Solicitations@hq.dhs.gov](mailto:HSARPA.Queries_about_Solicitations@hq.dhs.gov)

Program Manager:  
Dr. Keith Ward  
Homeland Security Advanced Research Projects Agency

Washington, D.C. 20407  
202-772-4458

Contracting Office Address:  
Mr. Don Wheatley  
Contracting & Grants Officer / Account Manager  
U.S. Army Medical Research Acquisition Activity  
820 Chandler Street  
Fort Detrick, MD 21702-5014

## **5.11 Objections to Solicitation and Award**

Any objections to the terms of this solicitation or to the conduct of receipt, evaluation or award of agreements must be presented in writing within ten calendar days of (1) the release of this solicitation or (2) the date the objector knows or should have known the basis for its objection. Objections should be provided in letter format, clearly stating that it is an objection to this solicitation or to the conduct of the evaluation or award of an agreement, and providing a clearly detailed factual statement of the basis for objection. Failure to comply with these directions is a basis for summary dismissal of the objection. Mail objections to the address listed in the proposal delivery information.

## **6. EVALUATION CRITERIA AND SELECTION PROCESS**

### **6.1 White Papers**

The evaluation of white papers will be accomplished through an independent technical review of each using the following criteria:

- Potential of the concept for meeting the desired system attributes and performance parameters given above;
- Demonstrated understanding of the critical technology challenges required to address the desired system performance parameters and a scientifically sound approach to addressing those issues, including a risk mitigation strategy;
- History of performance of the Team and Team members in developing related technologies and systems

### **6.2 Proposals**

The evaluation of proposals will be accomplished through an independent technical review of each using the following criteria, which are listed in descending order of relative importance:

- Potential of the concept for meeting the desired system attributes and performance parameters given above;

- Demonstrated understanding of the critical technology challenges required to address the desired system performance parameters and a sound approach to addressing those issues, including a risk mitigation strategy;
- History of performance of the Team and Team members in developing related technologies and systems; and
- Cost realism.

The final evaluation will be based upon an assessment of the overall best value to the government based upon these criteria.

### **6.3 Review and Selection Process**

It is the policy of HSARPA to ensure an impartial, equitable, and comprehensive evaluation of all proposals and to select the source (or combination of sources) whose offer is most advantageous for the Government.

In order to provide the desired evaluation, Government evaluators and employees and subcontractors of a support contractor will review and rate each submission. These personnel will have signed, and will be subject to, the terms and conditions of non-disclosure agreements. Bidders may request a government only review, but must indicate so on the cover page of the white paper and proposal.

## **7. LIST OF ATTACHMENTS**

Appendix A	CDC Select Agent List
Appendix B	CWA & TIC List
Appendix C	List of Excluded Bidders
Appendix D	List of Acronyms
Model OTA Contract	